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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA, SAN FRANCISCO DIVISION

STATE OF CALIFORNIA, *et al.*,

Plaintiffs,

v.

WILBUR L. ROSS, JR., *et al.*,

Defendants.

Civil Action No. 3:18-cv-01865-RS and
Civil Action No. 3:18-cv-02279-RS

**DEFENDANTS' NOTICE OF
SUPPLEMENTAL MATERIALS IN
SUPPORT OF MOTION IN LIMINE**

Judge: Hon. Richard Seeborg

City of San Jose, et al.,

Plaintiffs,

v.

WILBUR L. ROSS, JR., *et al.*,

Defendants.

At the pretrial conference on Wednesday, January 2, 2019, the Court heard oral argument on Defendants' Motion *in Limine* to exclude the testimony of four witnesses who plaintiffs disclosed for the first time on December 12, 2018, well past the discovery cut-off deadline. To explain their delay in disclosing these witnesses, counsel for plaintiffs asserted that they only recently became aware of the data-quality implications due to the inclusion of the citizenship question after the trial testimony of defendants' expert witness, Dr. John Abowd, in the New York case. As the attached exhibits demonstrate, Dr. Abowd consistently has stated in his deposition testimony, his expert report, and in the memoranda he prepared that are contained in the administrative record, that there will be data quality issues due to the inclusion of the citizenship question. Therefore, this justification for the dilatory disclosure of the witnesses should be rejected.

Date: January 3, 2019

Respectfully submitted,

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Exhibit 1



UNITED STATES DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. Census Bureau
Washington, DC 20233-0001

January 19, 2018

MEMORANDUM FOR: Wilbur L. Ross, Jr.
Secretary of Commerce

Through: Karen Dunn Kelley
Performing the Non-Exclusive Functions and Duties of the Deputy Secretary

Ron S. Jarmin
Performing the Non-Exclusive Functions and Duties of the Director

Enrique Lamas
Performing the Non-Exclusive Functions and Duties of the Deputy Director

From: John M. Abowd
Chief Scientist and Associate Director for Research and Methodology

Subject: Technical Review of the Department of Justice Request to Add
Citizenship Question to the 2020 Census

The Department of Justice has requested block-level citizen voting-age population estimates by OMB-approved race and ethnicity categories from the 2020 Census of Population and Housing. These estimates are currently provided in two related data products: the PL94-171 redistricting data, produced by April 1st of the year following a decennial census under the authority of 13 U.S.C. Section 141, and the Citizen Voting Age Population by Race and Ethnicity (CVAP) tables produced every February from the most recent five-year American Community Survey data. The PL94-171 data are released at the census block level. The CVAP data are released at the census block group level.

We consider three alternatives in response to the request: (A) no change in data collection, (B) adding a citizenship question to the 2020 Census, and (C) obtaining citizenship status from administrative records for the whole 2020 Census population.

We recommend either Alternative A or C. Alternative C best meets DoJ's stated uses, is comparatively far less costly than Alternative B, does not increase response burden, and does not harm the quality of the census count. Alternative A is not very costly and also does not harm the quality of the census count. Alternative B better addresses DoJ's stated uses than Alternative A. However, Alternative B is very costly, harms the quality of the census count, and would use substantially less accurate citizenship status data than are available from administrative sources.

<i>Summary of Alternatives</i>			
	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>
Description	No change in data collection	Add citizenship question to the 2020 Census (i.e., the DoJ request), all 2020 Census microdata remain within the Census Bureau	Leave 2020 Census questionnaire as designed and add citizenship from administrative records, all 2020 Census microdata and any linked citizenship data remain within the Census Bureau
Impact on 2020 Census	None	Major potential quality and cost disruptions	None
Quality of Citizen Voting-Age Population Data	Status quo	Block-level data improved, but with serious quality issues remaining	Best option for block-level citizenship data, quality much improved
Other Advantages	Lowest cost alternative	Direct measure of self-reported citizenship for the whole population	Administrative citizenship records more accurate than self-reports, incremental cost is very likely to be less than \$2M, USCIS data would permit record linkage for many more legal resident noncitizens
Shortcomings	Citizen voting-age population data remain the same or are improved by using small-area modeling methods	Citizenship status is misreported at a very high rate for noncitizens, citizenship status is missing at a high rate for citizens and noncitizens due to reduced self-response and increased item nonresponse, nonresponse followup costs increase by at least \$27.5M, erroneous enumerations increase, whole-person census imputations increase	Citizenship variable integrated into 2020 Census microdata outside the production system, Memorandum of Understanding with United States Citizen and Immigration Services required to acquire most up-to-date naturalization data

Approved: _____ Date: _____

John M. Abowd, Chief Scientist
and Associate Director for Research and Methodology

Detailed Analysis of Alternatives

The statistics in this memorandum have been released by the Census Bureau Disclosure Review Board with approval number CBDRB-2018-CDAR-014.

Alternative A: Make no changes

Under this alternative, we would not change the current 2020 Census questionnaire nor the planned publications from the 2020 Census and the American Community Survey (ACS). Under this alternative, the PL94-171 redistricting data and the citizen voting-age population (CVAP) data would be released on the current schedule and with the current specifications. The redistricting and CVAP data are used by the Department of Justice to enforce the Voting Rights Act. They are also used by state redistricting offices to draw congressional and legislative districts that conform to constitutional equal-population and Voting Rights Act nondiscrimination requirements. Because the block-group-level CVAP tables have associated margins of error, their use in combination with the much more precise block-level census counts in the redistricting data requires sophisticated modeling. For these purposes, most analysts and the DoJ use statistical modeling methods to produce the block-level eligible voter data that become one of the inputs to their processes.

If the DoJ requests the assistance of Census Bureau statistical experts in developing model-based statistical methods to better facilitate the DoJ's uses of these data in performing its Voting Rights Act duties, a small team of Census Bureau experts similar in size and capabilities to the teams used to provide the Voting Rights Act Section 203 language determinations would be deployed.

We estimate that this alternative would have no impact on the quality of the 2020 Census because there would be no change to any of the parameters underling the Secretary's revised life-cycle cost estimates. The estimated cost is about \$350,000 because that is approximately the cost of resources that would be used to do the modeling for the DoJ.

Alternative B: Add the question on citizenship to the 2020 Census questionnaire

Under this alternative, we would add the ACS question on citizenship to the 2020 Census questionnaire and ISR instrument. We would then produce the block-level citizen voting-age population by race and ethnicity tables during the 2020 Census publication phase.

Since the question is already asked on the American Community Survey, we would accept the cognitive research and questionnaire testing from the ACS instead of independently retesting the citizenship question. This means that the cost of preparing the new question would be minimal. We did not prepare an estimate of the impact of adding the citizenship question on the cost of reprogramming the Internet Self-Response (ISR) instrument, revising the Census Questionnaire Assistance (CQA), or redesigning the printed questionnaire because those components will not be finalized until after the March 2018 submission of the final questions. Adding the citizenship question is similar in scope and cost to recasting the race and ethnicity questions again, should that become necessary, and would be done at the same time. After the 2020 Census ISR, CQA and printed questionnaire are in final form, adding the citizenship question would be much more expensive and would depend on exactly when the implementation decision was made during the production cycle.

For these reasons, we analyzed Alternative B in terms of its adverse impact on the rate of voluntary cooperation via self-response, the resulting increase in nonresponse followup (NRFU), and the consequent effects on the quality of the self-reported citizenship data. Three distinct analyses support the conclusion of an adverse impact on self-response and, as a result, on the accuracy and quality of the 2020 Census. We assess the costs of increased NRFU in light of the results of these analyses.

B.1. Quality of citizenship responses

We considered the quality of the citizenship responses on the ACS. In this analysis we estimated item nonresponse rates for the citizenship question on the ACS from 2013 through 2016. When item nonresponse occurs, the ACS edit and imputation modules are used to allocate an answer to replace the missing data item. This results in lower quality data because of the statistical errors in these allocation models. The analysis of the self-responses responses is done using ACS data from 2013-2016 because of operational changes in 2013, including the introduction of the ISR option and changes in the followup operations for mail-in questionnaires.

In the period from 2013 to 2016, item nonresponse rates for the citizenship question on the mail-in questionnaires for non-Hispanic whites (NHW) ranged from 6.0% to 6.3%, non-Hispanic blacks (NHB) ranged from 12.0% to 12.6%, and Hispanics ranged from 11.6 to 12.3%. In that same period, the ISR item nonresponse rates for citizenship were greater than those for mail-in questionnaires. In 2013, the item nonresponse rates for the citizenship variable on the ISR instrument were NHW: 6.2%, NHB: 12.3% and Hispanic: 13.0%. By 2016 the rates increased for NHB and especially Hispanics. They were NHW: 6.2%, NHB: 13.1%, and Hispanic: 15.5% (a 2.5 percentage point increase). Whether the response is by mail-in questionnaire or ISR instrument, item nonresponse rates for the citizenship question are much greater than the comparable rates for other demographic variables like sex, birthdate/age, and race/ethnicity (data not shown).

B.2. Self-response rate analyses

We directly compared the self-response rate in the 2000 Census for the short and long forms, separately for citizen and noncitizen households. In all cases, citizenship status of the individuals in the household was determined from administrative record sources, not from the response on the long form. A noncitizen household contains at least one noncitizen. Both citizen and noncitizen households have lower self-response rates on the long form compared to the short form; however, the decline in self-response for noncitizen households was 3.3 percentage points greater than the decline for citizen households. This analysis compared short and long form respondents, categories which were randomly assigned in the design of the 2000 Census.

We compared the self-response rates for the same household address on the 2010 Census and the 2010 American Community Survey, separately for citizen and noncitizen households. Again, all citizenship data were taken from administrative records, not the ACS, and noncitizen households contain at least one noncitizen resident. In this case, the randomization is over the selection of household addresses to receive the 2010 ACS. Because the ACS is an ongoing survey sampling fresh households each month, many of the residents of sampled households completed the 2010 ACS with the same reference address as they used for the 2010 Census. Once again, the self-response rates were lower in the ACS than in the 2010 Census for both citizen and noncitizen households. In this 2010 comparison, moreover, the decline in self-response was 5.1 percentage points greater for noncitizen households than for citizen households.

In both the 2000 and 2010 analyses, only the long-form or ACS questionnaire contained a citizenship question. Both the long form and the ACS questionnaires are more burdensome than the shortform. Survey methodologists consider burden to include both the direct time costs of responding and the indirect costs arising from nonresponse due to perceived sensitivity of the topic. There are, consequently, many explanations for the lower self-response rates among all household types on these longer questionnaires. However, the only difference between citizen and noncitizen households in our studies was the presence of at least one noncitizen in noncitizen households. It is therefore a reasonable inference that a question on citizenship would lead to some decline in overall self-response because it would make the 2020 Census modestly more burdensome in the direct sense, and potentially much more burdensome in the indirect sense that it would lead to a larger decline in self-response for noncitizen households.

B.3. Breakoff rate analysis

We examined the response breakoff paradata for the 2016 ACS. We looked at all breakoff screens on the ISR instrument, and specifically at the breakoffs that occurred on the screens with the citizenship and related questions like place of birth and year of entry to the U.S. Breakoff paradata isolate the point in answering the questionnaire where a respondent discontinues entering data—breaks off—rather than finishing. A breakoff is different from failure to self-respond. The respondent started the survey and was prepared to provide the data on the Internet Self-Response instrument, but changed his or her mind during the interview.

Hispanics and non-Hispanic non-whites (NHNW) have greater breakoff rates than non-Hispanic whites (NHW). In the 2016 ACS data, breakoffs were NHW: 9.5% of cases while NHNW: 14.1% and Hispanics: 17.6%. The paradata show the question on which the breakoff occurred. Only 0.04% of NHW broke off on the citizenship question, whereas NHNW broke off 0.27% and Hispanics broke off 0.36%. There are three related questions on immigrant status on the ACS: citizenship, place of birth, and year of entry to the United States. Considering all three questions Hispanics broke off on 1.6% of all ISR cases, NHNW: 1.2% and NHW: 0.5%. A breakoff on the ISR instrument can result in follow-up costs, imputation of missing data, or both. Because Hispanics and non-Hispanic non-whites breakoff much more often than non-Hispanic whites, especially on the citizenship-related questions, their survey response quality is differentially affected.

B.4. Cost analysis

Lower self-response rates would raise the cost of conducting the 2020 Census. We discuss those increased costs below. They also reduce the quality of the resulting data. Lower self-response rates degrade data quality because data obtained from NRFU have greater erroneous enumeration and whole-person imputation rates. An erroneous enumeration means a census person enumeration that should not have been counted for any of several reasons, such as, that the person (1) is a duplicate of a correct enumeration; (2) is inappropriate (e.g., the person died before Census Day); or (3) is enumerated in the wrong location for the relevant tabulation (<https://www.census.gov/coverage-measurement/definitions/>). A whole-person census imputation is a census microdata record for a person for which all characteristics are imputed.

Our analysis of the 2010 Census coverage errors (Census Coverage Measurement Estimation Report: Summary of Estimates of Coverage for Persons in the United States, Memo G-01) contains the relevant data. That study found that when the 2010 Census obtained a valid self-response (219 million persons),

the correct enumeration rate was 97.3%, erroneous enumerations were 2.5%, and whole-person census imputations were 0.3%. All erroneous enumeration and whole-person imputation rates are much greater for responses collected in NRFU. The vast majority of NRFU responses to the 2010 Census (59 million persons) were collected in May. During that month, the rate of correct enumerations was only 90.2%, the rate of incorrect enumeration was 4.8%, and the rate of whole-person census imputations was 5.0%. June NRFU accounted for 15 million persons, of whom only 84.6% were correctly enumerated, with erroneous enumerations of 5.7%, and whole-person census imputations of 9.6%. (See Table 19 of 2010 Census Memorandum G-01. That table does not provide statistics for all NRFU cases in aggregate.)

One reason that the erroneous enumeration and whole-person imputation rates are so much greater during NRFU is that the data are much more likely to be collected from a proxy rather than a household member, and, when they do come from a household member, that person has less accurate information than self-responders. The correct enumeration rate for NRFU household member interviews is 93.4% (see Table 21 of 2010 Census Memorandum G-01), compared to 97.3% for non-NRFU households (see Table 19). The information for 21.0% of the persons whose data were collected during NRFU is based on proxy responses. For these 16 million persons, the correct enumeration rate is only 70.1%. Among proxy responses, erroneous enumerations are 6.7% and whole-person census imputations are 23.1% (see Table 21).

Using these data, we can develop a cautious estimate of the data quality consequences of adding the citizenship question. We assume that citizens are unaffected by the change and that an additional 5.1% of households with at least one noncitizen go into NRFU because they do not self-respond. We expect about 126 million occupied households in the 2020 Census. From the 2016 ACS, we estimate that 9.8% of all households contain at least one noncitizen. Combining these assumptions implies an additional 630,000 households in NRFU. If the NRFU data for those households have the same quality as the average NRFU data in the 2010 Census, then the result would be 139,000 fewer correct enumerations, of which 46,000 are additional erroneous enumerations and 93,000 are additional whole-person census imputations. This analysis assumes that, during the NRFU operations, a cooperative member of the household supplies data 79.0% of the time and 21.0% receive proxy responses. If all of these new NRFU cases go to proxy responses instead, the result would be 432,000 fewer correct enumerations, of which 67,000 are erroneous enumerations and 365,000 are whole-person census imputations.

For Alternative B, our estimate of the incremental cost proceeds as follows. Using the analysis in the paragraph above, the estimated NRFU workload will increase by approximately 630,000 households, or approximately 0.5 percentage points. We currently estimate that for each percentage point increase in NRFU, the cost of the 2020 Census increases by approximately \$55 million. Accordingly, the addition of a question on citizenship could increase the cost of the 2020 Census by at least \$27.5 million. It is worth stressing that this cost estimate is a lower bound. Our estimate of \$55 million for each percentage point increase in NRFU is based on an average of three visits per household. We expect that many more of these noncitizen households would receive six NRFU visits.

We believe that \$27.5 million is a conservative estimate because the other evidence cited in this report suggests that the differences between citizen and noncitizen response rates and data quality will be amplified during the 2020 Census compared to historical levels. Hence, the decrease in self-response for citizen households in 2020 could be much greater than the 5.1 percentage points we observed during the 2010 Census.

Alternative C: Use administrative data on citizenship instead of add the question to the 2020 Census

Under this alternative, we would add the capability to link an accurate, edited citizenship variable from administrative records to the final 2020 Census microdata files. We would then produce block-level tables of citizen voting age population by race and ethnicity during the publication phase of the 2020 Census using the enhanced 2020 Census microdata.

The Census Bureau has conducted tests of its ability to link administrative data to supplement the decennial census and the ACS since the 1990s. Administrative record studies were performed for the 1990, 2000 and 2010 Censuses. We discuss some of the implications of the 2010 study below. We have used administrative data extensively in the production of the economic censuses for decades.

Administrative business data from multiple sources are a key component of the production Business Register, which provides the frames for the economic censuses, annual, quarterly, and monthly business surveys. Administrative business data are also directly tabulated in many of our products.

In support of the 2020 Census, we moved the administrative data linking facility for households and individuals from research to production. This means that the ability to integrate administrative data at the record level is already part of the 2020 Census production environment. In addition, we began regularly ingesting and loading administrative data from the Social Security Administration, Internal Revenue Service and other federal and state sources into the 2020 Census data systems. In assessing the expected quality and cost of Alternative C, we assume the availability of these record linkage systems and the associated administrative data during the 2020 Census production cycle.

C.1. Quality of administrative record versus self-report citizenship status

We performed a detailed study of the responses to the citizenship question compared to the administrative record citizenship variable for the 2000 Census, 2010 ACS and 2016 ACS. These analyses confirm that the vast majority of citizens, as determined by reliable federal administrative records that require proof of citizenship, correctly report their status when asked a survey question. These analyses also demonstrate that when the administrative record source indicates an individual is not a citizen, the self-report is “citizen” for no less than 23.8% of the cases, and often more than 30%.

For all of these analyses, we linked the Census Bureau’s enhanced version of the SSA Numident data using the production individual record linkage system to append an administrative citizenship variable to the relevant census and ACS microdata. The Numident data contain information on every person who has ever been issued a Social Security Number or an Individual Taxpayer Identification Number. Since 1972, SSA has required proof of citizenship or legal resident alien status from applicants. We use this verified citizenship status as our administrative citizenship variable. Because noncitizens must interact with SSA if they become naturalized citizens, these data reflect current citizenship status albeit with a lag for some noncitizens.

For our analysis of the 2000 Census long-form data, we linked the 2002 version of the Census Numident data, which is the version closest to the April 1, 2000 Census date. For 92.3% of the 2000 Census long-form respondents, we successfully linked the administrative citizenship variable. The 7.7% of persons for whom the administrative data are missing is comparable to the item non-response for self-responders in the mail-in pre-ISR-option ACS. When the administrative data indicated that the 2000 Census respondent was a citizen, the self-response was citizen: 98.8%. For this same group, the long-form response was

noncitizen: 0.9% and missing: 0.3%. By contrast, when the administrative data indicated that the respondent was not a citizen, the self-report was citizen: 29.9%, noncitizen: 66.4%, and missing: 3.7%.

In the same analysis of 2000 Census data, we consider three categories of individuals: the reference person (the individual who completed the census form for the household), relatives of the reference person, and individuals unrelated to the reference person. When the administrative data show that the individual is a citizen, the reference person, relatives of the reference person, and nonrelatives of the reference person have self-reported citizenship status of 98.7%, 98.9% and 97.2%, respectively. On the other hand, when the administrative data report that the individual was a noncitizen, the long-form response was citizen for 32.9% of the reference persons; that is, reference persons who are not citizens according to the administrative data self-report that they are not citizens in only 63.3% of the long-form responses. When they are reporting for a relative who is not a citizen according to the administrative data, reference persons list that individual as a citizen in 28.6% of the long-form responses. When they are reporting for a nonrelative who is not a citizen according to the administrative data, reference persons list that individual as a citizen in 20.4% of the long-form responses.

We analyzed the 2010 and 2016 ACS citizenship responses using the same methodology. The 2010 ACS respondents were linked to the 2010 version of the Census Numident. The 2016 ACS respondents were linked to the 2016 Census Numident. In 2010, 8.5% of the respondents could not be linked, or had missing citizenship status on the administrative data. In 2016, 10.9% could not be linked or had missing administrative data. We reached the same conclusions using 2010 and 2016 ACS data with the following exceptions. When the administrative data report that the individual is a citizen, the self-response is citizen on 96.9% of the 2010 ACS questionnaires and 93.8% of the 2016 questionnaires. These lower self-reported citizenship rates are due to missing responses on the ACS, not misclassification. As we noted above, the item nonresponse rate for the citizenship question has been increasing. These item nonresponse data show that some citizens are not reporting their status on the ACS at all. In 2010 and 2016, individuals for whom the administrative data indicate noncitizen respond citizen in 32.7% and 34.7% of the ACS questionnaires, respectively. The rates of missing ACS citizenship response are also greater for individuals who are noncitizens in the administrative data (2010: 4.1%, 2016: 7.7%). The analysis of reference persons, relatives, and nonrelatives is qualitatively identical to the 2000 Census analysis.

In all three analyses, the results for racial and ethnic groups and for voting age individuals are similar to the results for the whole population with one important exception. If the administrative data indicate that the person is a citizen, the self-report is citizen at a very high rate with the remainder being predominately missing self-reports for all groups. If the administrative data indicate noncitizen, the self-report is citizen at a very high rate (never less than 23.8% for any racial, ethnic or voting age group in any year we studied). The exception is the missing data rate for Hispanics, who are missing administrative data about twice as often as non-Hispanic blacks and three times as often as non-Hispanic whites.

C.2. Analysis of coverage differences between administrative and survey citizenship data

Our analysis suggests that the ACS and 2000 long form survey data have more complete coverage of citizenship than administrative record data, but the relative advantage of the survey data is diminishing. Citizenship status is missing for 10.9 percent of persons in the 2016 administrative records, and it is missing for 6.3 percent of persons in the 2016 ACS. This 4.6 percentage point gap between administrative and survey missing data rates is smaller than the gap in 2000 (6.9 percentage points) and 2010 (5.6

percentage points). Incomplete (through November) pre-production ACS data indicate that citizenship item nonresponse has again increased in 2017.

There is an important caveat to the conclusion that survey-based citizenship data are more complete than administrative records, albeit less so now than in 2000. The methods used to adjust the ACS weights for survey nonresponse and to allocate citizenship status for item nonresponse assume that the predicted answers of the sampled non-respondents are statistically the same as those of respondents. Our analysis casts serious doubt on this assumption, suggesting that those who do not respond to either the entire ACS or the citizenship question on the ACS are not statistically similar to those who do; in particular, their responses to the citizenship question would not be well-predicted by the answers of those who did respond.

The consequences of missing citizenship data in the administrative records are asymmetric. In the Census Numident, citizenship data may be missing for older citizens who obtained SSNs before the 1972 requirement to verify citizenship, naturalized citizens who have not confirmed their naturalization to SSA, and noncitizens who do not have an SSN or ITIN. All three of these shortcomings are addressed by adding data from the United States Citizen and Immigration Services (USCIS). Those data would complement the Census Numident data for older citizens and update those data for naturalized citizens. A less obvious, but equally important benefit, is that they would permit record linkage for legal resident aliens by allowing the construction of a supplementary record linkage master list for such people, who are only in scope for the Numident if they apply for and receive an SSN or ITIN. Consequently, the administrative records citizenship data would most likely have both more accurate citizen status and fewer missing individuals than would be the case for any survey-based collection method. Finally, having two sources of administrative citizenship data permits a detailed verification of the accuracy of those sources as well.

C.3. Cost of administrative record data production

For Alternative C, we estimate that the incremental cost, except for new MOUs, is \$450,000. This cost estimate includes the time to develop an MOU with USCIS, estimated ingestion and curation costs for USCIS data, incremental costs of other administrative data already in use in the 2020 Census but for which continued acquisition is now a requirement, and staff time to do the required statistical work for integration of the administrative-data citizenship status onto the 2020 Census microdata. This cost estimate is necessarily incomplete because we have not had adequate time to develop a draft MOU with USCIS, which is a requirement for getting a firm delivery cost estimate from the agency. Acquisition costs for other administrative data acquired or proposed for the 2020 Census varied from zero to \$1.5M. Thus the realistic range of cost estimates, including the cost of USCIS data, is between \$500,000 and \$2.0M

Exhibit 2



UNITED STATES DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. Census Bureau
Washington, DC 20233-0001

March 1, 2018

MEMORANDUM FOR: Wilbur L. Ross, Jr.
Secretary of Commerce

Through: Karen Dunn Kelley
Performing the Non-Exclusive Functions and Duties of the Deputy
Secretary

Ron S. Jarmin
Performing the Non-Exclusive Functions and Duties of the Director

Enrique Lamas
Performing the Non-Exclusive Functions and Duties of the Deputy
Director

From: John M. Abowd
Chief Scientist and Associate Director for Research and Methodology

Subject: Preliminary analysis of Alternative D (Combined Alternatives B and C)

See attached.

Approved: _____ Date: _____
John M. Abowd, Chief Scientist
and Associate Director for Research and Methodology

Preliminary Analysis of Alternative D

At the Secretary's request we performed a preliminary analysis of combining Alternative B (asking the citizenship question of every household on the 2020 Census) and Alternative C (do not ask the question, link reliable administrative data on citizenship status instead) in the January 19, 2018 draft memo to the Department of Commerce into a new Alternative D. Here we discuss Alternative D, the weaknesses in Alternative C on its own, whether and how survey data could address these weaknesses, implications of including a citizenship question for using administrative data, and methodological challenges.

Description of Alternative D: Administrative data from the Social Security Administration (SSA), Internal Revenue Service (IRS), U.S. Citizenship and Immigration Services (USCIS), and the State Department would be used to create a comprehensive statistical reference list of current U.S. citizens. Nevertheless, there will be some persons for whom no administrative data are available. To obtain citizenship information for this sub-population, a citizenship question would be added to the 2020 Census questionnaire. The combined administrative record and 2020 Census data would be used to produce baseline citizenship statistics by 2021. Any U.S. citizens appearing in administrative data after the version created for the 2020 Census would be added to the comprehensive statistical reference list. There would be no plan to include a citizenship question on future Decennial Censuses or American Community Surveys. The comprehensive statistical reference list, built from administrative records and augmented by the 2020 Census answers would be used instead. The comprehensive statistical reference list would be kept current, gradually replacing almost all respondent-provided data with verified citizenship status data.

What are the weaknesses in Alternative C?

In the 2017 Numident (the latest available), 6.6 million persons born outside the U.S. have blank citizenship among those born in 1920 or later with no year of death. The evidence suggests that citizenship is not missing at random. Of those with missing citizenship in the Numident, a much higher share appears to be U.S. citizens than compared to those for whom citizenship data are not missing. Nevertheless, some of the blanks may be noncitizens, and it would thus be useful to have other sources for them.

A second question about the Numident citizenship variable is how complete and timely its updates are for naturalizations. Naturalized citizens are instructed to immediately apply for a new SSN card. Those who wish to work have an incentive to do so quickly, since having an SSN card with U.S. citizenship will make it easier to pass the E-Verify process when applying for a job, and it will make them eligible for government programs. But we do not know what fraction of naturalized citizens actually notify the SSA, and how soon after being naturalized they do so.

A third potential weakness of Numident citizenship is that some people are not required to have a Social Security Number (SSN), whether they are a U.S. citizen or not. It would also be useful to have a data source on citizenship that did not depend on the SSN application and tracking process inside SSA. This is why we proposed the MOU with the USCIS for naturalizations, and why we have now begun pursuing an MOU with the State Department for data on all citizens with passports.

IRS Individual Taxpayer Identification Numbers (ITIN) partially fill the gap in Numident coverage of noncitizen U.S. residents. However, not all noncitizen residents without SSNs apply for ITINs. Only those making IRS tax filings apply for ITINs. Once again, it would be useful to have a data source that did not depend on the ITIN process. The USCIS and State Department MOUs would provide an alternative source in this context as well.

U.S. Citizenship and Immigration Services (USCIS) data on naturalizations, lawful permanent residents, and I-539 non-immigrant visa extensions can partially address the weaknesses of the Numident. The USCIS data provide up-to-date information since 2001 (and possibly back to 1988, but with incomplete records prior to 2001). This will fill gaps for naturalized citizens, lawful permanent residents, and persons with extended visa applications without SSNs, as well as naturalized citizens who did not inform SSA about their naturalization. The data do not cover naturalizations occurring before 1988, as well as not covering and some between 1988-2000. USCIS data do not always cover children under 18 at the time a parent became a naturalized U.S. citizen. Such children automatically become U.S. citizens under the Child Citizenship Act of 2000. The USCIS receives notification of some, but not all, of these child naturalizations. Others inform the U.S. government of their U.S. citizenship status by applying for U.S. passports, which are less expensive than the application to notify the USCIS. USCIS visa applications list people's children, but those data may not be in electronic form.

U.S. passport data, available from the State Department, can help plug the gaps for child naturalizations, blanks on the Numident, and out-of-date citizenship information on the Numident for persons naturalized prior to 2001. Since U.S. citizens are not required to have a passport, however, these data will also have gaps in coverage.

Remaining citizenship data gaps in Alternative C include the following categories:

1. U.S. citizens from birth with no SSN or U.S. passport. They will not be processed by the production record linkage system used for the 2020 Census because their personally identifiable information won't find a matching Protected Identification Key (PIK) in the Person Validation System (PVS).
2. U.S. citizens from birth born outside the U.S., who do not have a U.S. passport, and either applied for an SSN prior to 1974 and were 18 or older, or applied before the age of 18 prior to 1978. These people will be found in PVS, but none of the administrative sources discussed above will reliably generate a U.S. citizenship variable.
3. U.S. citizens who were naturalized prior to 2001 and did not inform SSA of their naturalization because they originally applied for an SSN after they were naturalized, and it was prior to when citizenship verification was required for those born outside the U.S. (1974). These people already had an SSN when they were naturalized and they didn't inform SSA about the naturalization, or they didn't apply for an SSN. The former group have inaccurate data on the Numident. The latter group will not be found in PVS.
4. U.S. citizens who were automatically naturalized if they were under the age of 18 when their parents became naturalized in 2000 or later, and did not inform USCIS or receive a U.S. passport. Note that such persons would not be able to get an SSN with U.S. citizenship on the card without either a U.S. passport or a certificate from USCIS. These people will also not be found in the PVS.

5. Lawful permanent residents (LPR) who received that status prior to 2001 and either do not have an SSN or applied for an SSN prior to when citizenship verification was required for those born outside the U.S. (1974). The former group will not be found in PVS. The latter group has inaccurate data in Numident.
6. Noncitizen, non-LPR, residents who do not have an SSN or ITIN and who did not apply for a visa extension. These persons will not be found in PVS.
7. Persons with citizenship information in administrative data, but the administrative and decennial census data cannot be linked due to missing or discrepant PII.

Can survey data address the gaps in Alternative C?

One might think that survey data could help fill the above gaps, either when their person record is not linked in the PVS, and thus they have no PIK, or when they have a PIK but the administrative data lack up-to-date citizenship information. Persons in Category 6, however, have a strong incentive to provide an incorrect answer, if they answer at all. A significant, but unknown, fraction of persons without PIKs are in Category 6. Distinguishing these people from the other categories of persons without PIKs is an inexact science because there is no feasible method of independently verifying their non-citizen status. Our comparison of ACS and Numident citizenship data suggests that a large fraction of LPRs provide incorrect survey responses. This suggests that survey-collected citizenship data may not be reliable for many of the people falling in the gaps in administrative data. This calls into question their ability to improve upon Alternative C.

With Alternative C, and no direct survey response, the Census Bureau's edit and imputation procedures would make an allocation based primarily on the high-quality administrative data. In the presence of a survey response, but without any linked administrative data for that person, the edit would only be triggered by blank citizenship. A survey response of "citizen" would be accepted as valid. There is no scientifically defensible method for rejecting a survey response in the absence of alternative data for that respondent.

How might inclusion of a citizenship question on the questionnaire affect the measurement of citizenship with administrative data? Absent an in-house administrative data census, measuring citizenship with administrative data requires that persons in the Decennial Census be linked to the administrative data at the person level. The PVS system engineered into the 2020 Census does this using a very reliable technology. However, inclusion of a citizenship question on the 2020 Census questionnaire is very likely to reduce the self-response rate, pushing more households into Nonresponse Followup (NRFU). Not only will this likely lead to more incorrect enumerations, but it is also expected to increase the number of persons who cannot be linked to the administrative data because the NRFU PII is lower quality than the self-response data. In the 2010 Decennial Census, the percentage of NRFU persons who could be linked to administrative data rate was 81.6 percent, compared to 96.7 percent for mail responses. Those refusing to self-respond due to the citizenship question are particularly likely to refuse to respond in NRFU as well, resulting in a proxy response. The NRFU linkage rates were far lower for proxy responses than self-responses (33.8 percent vs. 93.0 percent, respectively).

Although persons in Category 6 will not be linked regardless of response mode, it is common for households to include persons with a variety of citizenship statuses. If the whole household does not self-

respond to protect the members in Category 6, the record linkage problem will be further aggravated. Thus, not only are citizenship survey data of suspect quality for persons in the gaps for Alternative C, collecting these survey data would reduce the quality of the administrative records when used in Alternative D by lowering the record linkage rate for persons with administrative citizenship data.

What methodological challenges are involved when combining these sources?

Using the 2020 Census data only to fill in gaps for persons without administrative data on citizenship would raise questions about why 100 percent of respondents are being burdened by a citizenship question to obtain information for the two percent of respondents where it is missing.

Including a citizenship question in the 2020 Census does not solve the problem of incomplete person linkages when producing citizenship statistics after 2020. Both the 2020 decennial record and the record with the person's future location would need to be found in PVS to be used for future statistics.

In sum, Alternative D would result in poorer quality citizenship data than Alternative C. It would still have all the negative cost and quality implications of Alternative B outlined in the draft January 19, 2018 memo to the Department of Commerce.

Exhibit 3

Expert Disclosure of John M. Abowd

October 3, 2018

I. Introduction

Qualifications

I am the Chief Scientist and Associate Director for Research and Methodology at the United States Census Bureau. I have served in that capacity since June 2016. My position is covered by an Intergovernmental Personnel Act (IPA) agreement between Cornell University and the Census Bureau. At Cornell, I am the Edmund Ezra Day professor of economics, professor of statistics and information science, and director of the Labor Dynamics Institute.

In 1977, I received my Ph.D. in economics from the University of Chicago with specializations in econometrics and labor economics. My B.A. in economics is from the University of Notre Dame.

I have been a university professor since 1976. My first appointment was assistant professor of economics at Princeton University. I was also assistant and associate professor of econometrics and industrial relations at the University of Chicago Graduate School of Business. In 1987, I was appointed associate professor of industrial and labor relations with indefinite tenure at Cornell University, where I am still employed.

I am a member and fellow of the American Statistical Association, Econometric Society, and Society of Labor Economists (president 2014). I am an elected member of the International Statistical Institute. I am also a member of the American Economic Association, International Association for Official Statistics, National Association for Business Economists, American Association for Public Opinion Research, and American Association of Wine Economists. I regularly attend and present papers at the meetings of all of these organizations.

I currently serve on the American Economic Association Committee on Economic Statistics. I have also served on the National Academy of Sciences Committee on National Statistics, the Conference on Research in Income and Wealth Executive Committee, and the Bureau of Labor Statistics Technical Advisory Board for the National Longitudinal Surveys (chair: 1999-2001).

Relevant professional experience

In 1998, the Census Bureau and Cornell University entered into the first of a sequence of IPAs and other contracts under which I served continuously as Distinguished Senior Research Fellow at the Census Bureau until I assumed my current position in 2016, under a new IPA contract. While I was a senior research fellow, I worked with numerous senior executives. This includes Directors (Martha Riche, Kenneth Prewitt, C. Louis Kincannon, Stephen Murdoch, Robert Groves, and John Thompson), Deputy Directors (Hermann Habermann, Thomas Mesenbourg, and Nancy Potok), Chief Scientists (Roderick Little and Thomas Louis), and numerous other associate directors, assistant directors, and division chiefs. I also worked with Chief Economists John Haltiwanger, J. Bradford Jensen, Daniel Weinberg, and Lucia Foster, and researchers in all program areas.

I was one of three senior researchers who founded the Longitudinal Employer-Household Dynamics (LEHD) program at the Census Bureau. This program produces detailed public-use statistical data on the characteristics of workers and employers in local labor markets using large-scale linked administrative, census and survey data from many different sources. The program is acknowledged as the Census Bureau's first 21st Century data product: built to the specifications of local labor market specialists without additional survey burden, and published using state-of-the-art confidentiality protection. In addition to very substantial financial support from the Census Bureau, this project was supported by a \$4.1 million grant from the National Science Foundation (NSF) on which I was the lead Principal Investigator.

From 2004 through 2009, I was the lead Principal Investigator on the \$3.3 million NSF-supported collaborative project with the Census Bureau to modernize secure access to confidential social science data. This project led to the first production implementation worldwide of differential privacy¹ for OnTheMap—a product of the LEHD program. It also produced prototype confidential data access systems with public-use synthetic micro-data supported by direct analysis of the confidential data on validation servers. These projects were the precursors to the Census Bureau's current program to implement central differential privacy for all publications from the 2020 Census of Population and Housing, which will be the first large-scale production implementation worldwide.

From 2011 until I assumed my position as Chief Scientist at the Census Bureau in 2016, I was the Principal Investigator of the Cornell University node of the NSF-Census Research Network (NCRN), one of eight such nodes that worked collaboratively with the Census Bureau and other federal statistical agencies to identify important theoretical and applied research projects of direct programmatic importance to the agencies. The Cornell node produced the fundamental science explaining the distinct roles of statistical policymakers and computer scientists in the design and implementation of differential privacy systems at statistical agencies.

I have published more than 100 scholarly books, monographs, and articles in the disciplines of economics, econometrics, statistics, computer science, and information science. I have been the principal investigator or co-principal investigator on 35 sponsored research projects. My full Curriculum Vitae is attached to this report.

What I was asked to analyze

I was asked to provide expert analysis in three areas:

1. Is there credible quantitative evidence that the addition of a citizenship question on the 2020 Census would affect the cost and quality of that census?
2. Are the activities of the Census Bureau appropriate and adequate to address any cost and quality consequences that might arise during the conduct of the 2020 Census?
3. Did the Census Bureau follow appropriate statistical quality standards when it placed the citizenship question from the American Community Survey onto the proposed questionnaire in the 2020 Census without further testing?

¹ Differential privacy is the leading privacy-enhancing data publication method in computer science.

Key conclusions

1. The Census Bureau produced credible quantitative evidence that the addition of a citizenship question to the 2020 Census could be expected to lower the self-response rate in an identifiable and large sub-population—households that may contain non-citizens. The lower self-response rate can be expected to increase Nonresponse Followup (NRFU) costs and lower the quality of census data other than the count itself. Therefore, the Census Bureau can and will make appropriate adjustments to various components of the 2020 Census, including NRFU and the Integrated Partnership and Communications Program to mitigate these effects.
2. Neither the Census Bureau nor any external expert has produced credible quantitative evidence that the addition of a citizenship question to the 2020 Census would increase the net undercount or increase differential net undercounts for identifiable sub-populations. Therefore, there is no credible quantitative evidence that the addition of the citizenship question would affect the accuracy of the count.
3. The citizenship question on the American Community Survey was thoroughly tested, most recently in 2006. Neither the Census Bureau's Quality Standards nor the Office of Management and Budget Statistical Policy Directives require further testing of this question before it can be used on the 2020 Census. If the OMB believes that further testing is necessary, it may request and provide clearance for such testing before issuing the clearance for the 2020 Census.

II. Quantitative evidence on the effects of the citizenship question

The purpose of the Decennial Census of Population and Housing is to conduct an actual enumeration of the population and disseminate the results to the President, the states, and the American people. The Census Bureau conducts the census in the 50 states, the District of Columbia, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands. When conducting a decennial census, our goal is to count everyone once, only once, and in the right place.

The 2020 Census has been in testing, development and implementation for almost a full decade. On December 12, 2017, the Department of Justice requested the addition of a question on citizenship for the purpose of producing block-level statistics on the citizen voting-age population in support of enforcement of the Voting Rights Act. On March 26, 2018, the Secretary of Commerce instructed the Census Bureau to add a question on citizenship to the 2020 Census.

In the course of the deliberations and research that occurred at the Census Bureau between December 15, 2017, when we were notified of the Department of Justice (DoJ) request, and the present, I supervised the preparation of a sequence of technical responses to the DoJ request (AR 1277-1285, 1308-1312) and the work of a team of researchers who subsequently released a technical working paper in August 2018 (COM_DIS00009833–989). I will only summarize them here.

First, at the time those memos and research papers were written, I was not aware of any randomized controlled trial (RCT) that provided credible quantitative information about the effects of the addition of a citizenship question on the net undercount in the decennial census. That is still the case. Randomized controlled trials are the gold standard for internal validity, and none exist that can address the potential consequences for net undercount (the coverage measure of choice for assessing the accuracy of a decennial census). Even if such an RCT had existed, there would remain the question of generalizability of

its results. However, disagreement about the generalizability of an internally valid RCT estimate of an effect of the citizenship question on the net undercount should be a discussion based on specific evidence rather than an expert opinion based on accumulated experience.

Second, the internal Census Bureau research relies on an alternative to RCTs, called a *natural experiment* or *difference-in-difference* estimator, to quantify the potential effect of a citizenship question on the *unit self-response rate*—the rate at which households voluntarily complete the census questionnaire and return it to the Census Bureau. The research statistically isolates a particular sub-population—households that contain at least one non-citizen or at least one person with unknown citizenship status—and compares it to a different sub-population—households that contain only citizens. The details of the way those sub-populations were isolated can be found in the technical paper. The salient result is that households containing at least one noncitizen or person of unknown citizenship status may be less likely to self-respond to the 2020 Census if it contains a question on citizenship. Putting the question on the census is therefore likely to depress self-response on average if the control group—households that contain all citizens—do not change their self-response rates. Because we must rely on a natural experiment, however, we have no evidence on control group behavior. That is because we cannot design the estimator to produce the quantity we seek to address (overall effect on self-response) and must work with the quantity we can estimate (the differential effect on self-response in the households with non-citizens compared to households with citizens). These estimates of the effect of the presence of a citizenship question on self-response rates are used in the next section to estimate the increased NRFU costs (discussed below).

It is important to stress that the estimated decrease in self-response rates does not translate into an increase in net undercount, and the use of our estimates as if they did is wholly inappropriate. Controlling net undercount depends critically on the Census Bureau's ability to fully enumerate the housing stock in the country, and then to determine which housing units are occupied, vacant, or nonexistent. Once a housing unit is known to be occupied, the quality of the data recorded for the occupants of that housing unit depends critically on self-response. Voluntary self-response produces much more accurate measures of the age, sex and other variables measured by the questionnaire. This is distinct from the process by which the Census Bureau ensures that it gets an accurate count in the NRFU operation (as measured by the net undercount statistics in the coverage evaluation program).

Third, our research clearly showed that there is a serious issue regarding the accuracy of self-reported citizenship status. We did this by using record linkage methods to compare the answers on surveys to the citizenship status recorded in high quality administrative data. For individuals identified as citizens in the administrative data and who answer the citizenship question in the ACS, over 99 percent self-report that they are citizens. For individuals identified as noncitizens in the administrative data, a substantial minority (30 to 35 percent, depending on the year) report that they are citizens.

Given the cost and data-quality concerns, the Census Bureau consistently recommended using administrative records rather than a citizenship question. However, this recommendation does not imply that asking the citizenship question will result in a less accurate count. We have no credible quantitative evidence to support that conclusion.

III. Nonresponse followup consequences of the citizenship question

Nonresponse followup (NRFU) is the largest of the decennial census field data collection operations. The primary purpose of NRFU is to conduct in-person contact attempts at each and every housing unit address that did not provide a response to the decennial census questionnaire using an online questionnaire, by returning a completed paper questionnaire, or by providing response information to a Census customer service representative over the telephone. We estimate, after providing approximately six weeks for individuals to respond, that the self-response rate will be 60.5 percent of all housing units.² This self-response rate estimate means that we also estimate that 39.5 percent of the housing unit addresses in the universe will not initially respond.³ In NRFU, field representatives (known as enumerators) attempt to locate each nonresponding housing unit address, determine its status (occupied, vacant, non-existent), and for occupied housing unit addresses conduct an interview with a knowledgeable person who can provide responses to the decennial census questionnaire.

The Census Bureau is prepared to conduct the 2020 Census NRFU operation and believes that those efforts will result in a complete enumeration. The Census Bureau has demonstrated the ability to successfully conduct a NRFU operation in previous censuses and in the 2018 End-to-End Census Test, the last field test prior to the 2020 Census. It has tested the operational design in evaluations over the course of the decade. The evaluations, along with historical data from past censuses and the American Community Survey, have informed the Census Bureau's operational design and the assumptions supporting that design. These evaluations have identified factors that could impact the operational implementation of NRFU. They have also provided evidence on the effects of an operational outcome such as a lower than estimated self-response rates.⁴ Contingency funding to handle deviations from the planned operations are built in to the Life Cycle Cost Estimate (LCCE). The decision to include a question on citizenship has not impacted the NRFU operational design, but it will modify the execution of that design, if the self-response rate at the start of NRFU is below the estimate built into the LCCE. As documented in Section II, there is no evidence, to date, that the addition of the citizenship question will result in a less accurate enumeration. We are, however, prepared to react, adjust, and complete NRFU to ensure an accurate count and deliver the highest quality census data.

Background

To understand how the NRFU efforts work, one must first understand the basic methodology used for counting individuals for purposes of the decennial census. To conduct the census, the Census Bureau must consider all places where someone lives or could live as of April 1, 2020 (Census Day). We classify these places as one of two types of *living quarters*: housing units and group quarters. Living quarters are usually found in structures intended for residential use, but also may be found in structures intended for nonresidential use as well as in places such as tents, vans, hotels/motels, and emergency and transitional shelters.

² U.S. Census Bureau (2017d) page 15.

³ Calculated value – 100 percent minus 60.5 percent.

⁴ For example, preliminary analysis of the 2018 End-to-End Census Test suggests that shortfalls in recruiting NRFU enumerators can be partially or fully offset by efficiency gains from the Field Operational Control System.

Exhibit 4

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

NEW YORK IMMIGRATION COALITION, ET AL.,

Plaintiffs,

vs. Case No. 1:18-CF-05025-JMF

UNITED STATES DEPARTMENT OF COMMERCE, ET AL.,
Defendants.

Washington, D.C.

Wednesday, August 29, 2018

Deposition of:

DR. JOHN ABOWD

called for oral examination by counsel for
Plaintiffs, pursuant to notice, at the office of
Arnold & Porter, 601 Massachusetts Avenue NW,
Washington, D.C., before KAREN LYNN JORGENSEN,
RPR, CSR, CCR of Capital Reporting Company,
beginning at 9:06 a.m., when were present on
behalf of the respective parties:

Veritext Legal Solutions

Mid-Atlantic Region

1250 Eye Street NW - Suite 350

Washington, D.C. 20005

1 questions.

2 BY MR. TILAK:

3 Q Is natural experiment an accepted method
4 of research in social science?

5 A Yes.

6 Q Do you believe a decline in self-response
7 rates in households with at least one noncitizen
8 will result in a higher undercount for noncitizen
9 households?

10 A We don't have any evidence to suggest
11 that hypothesis is true.

12 Q Do you have any evidence to suggest the
13 hypothesis is false?

14 A No.

15 Q So you just don't know, one way or the
16 other?

17 A No. We think we know. We believe that
18 the net undercount -- I put the net before your
19 undercount, but I'm putting it there
20 exclusively -- that the net undercount depends
21 primarily on the energy and efficacy of the
22 nonresponse follow-up efforts. That is a lesson

1 learned over multiple censuses where we have
2 beaten that net undercount down by perfecting
3 processes that get at least some information about
4 the house- -- household -- housing unit.

5 The critical piece of information is how
6 many people live there. So if you can determine
7 that, then the rest of what's happening is you
8 don't know anything about them, so the quality of
9 the analyses you're going to do on anything other
10 than the population count is affected.

11 And truth in discussion, we know that
12 there's a differential in that undercount. We
13 make active efforts to abate that, and we have no
14 evidence that the differential undercount is
15 related to the presence of a citizen question, but
16 it is related to the macroenvironment when you
17 conduct the census. And that's not something you
18 can do a randomized controlled trial on.

19 Q Are you aware of any analysis or research
20 looking at the relationship between self-response
21 and undercount?

22 A Again, net undercount, no.

Exhibit 5

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- - - - - x
STATE OF NEW YORK, et al., :
Plaintiffs, :
vs. : Civil Action No.
UNITED STATES DEPARTMENT OF : 1:18-cv-2921-JMF
COMMERCE, et al., :
Defendants. : Volume II

- - - - - x
CONTINUED VIDEOTAPED 30(b)(6) DEPOSITION OF:
UNITED STATES CENSUS BUREAU GIVEN BY JOHN M. ABOWD
DATE: Friday, October 5, 2018
TIME: 9:05 a.m.
LOCATION: Arnold & Porter Kaye Scholer
601 Massachusetts Avenue, N.W.
Washington, D.C.
REPORTED BY: Denise M. Brunet, RPR
Reporter/Notary
Veritext Legal Solutions
1250 Eye Street, N.W., Suite 350
Washington, D.C. 20005

1 that I might not agree with.

2 Q Let's turn to page 2 of the white paper,
3 Bates COM_DIS09834. The last sentence of the
4 abstract reads, "The evidence in this paper also
5 suggests that adding a citizenship question to the
6 2020 census would lead to lower self-response
7 rates in households potentially containing
8 non-citizens, resulting in higher field work costs
9 and a lower quality population count."

10 Did I read that accurately?

11 A Yes, you did.

12 Q Does the Census Bureau agree that the
13 balance of evidence available suggests that adding
14 a citizenship question to the 2020 census would
15 lead to lower self-response rates in households
16 potentially containing non-citizens?

17 A Yes.

18 Q Does the Census Bureau agree that the
19 balance of evidence available suggests that adding
20 a citizenship question to the 2020 census would
21 lead to a lower quality population count?

22 A I have to define lower quality population

1 count to answer that question. May I?

2 Q Yes, please.

3 A So the usual accuracy measures are two:
4 Net undercount and then its components, gross
5 omissions and erroneous enumerations and
6 whole-person census imputations. We have no
7 evidence that it would affect the quality as
8 regards net undercount. We have evidence that it
9 would affect the count -- the quality as regards
10 components of the errors in the enumeration.

11 Q We'll get back to that. Thank you for
12 that clarification.

13 Could you turn to page 8 in the white
14 paper, Bates number COM_DIS09840? And I want to
15 look at figure 1, panel A. This graph shows item
16 non-response, which is the failure to answer
17 certain questions, on the American Community
18 Survey, or ACS, in the year 2016, broken down by
19 various racial and ethnic subgroups; is that
20 correct?

21 A Racial, ethnic and demographic subgroups,
22 yes.

1 It does not mean net undercount.

2 THE REPORTER: Could you please repeat
3 your answer.

4 THE WITNESS: Accurate enumeration in
5 this sentence means enumeration errors and
6 whole-person census imputations. It does not mean
7 net undercount.

8 BY MR. HO:

9 Q Now, if you send an in-person enumerator
10 to a household that doesn't self-respond and that
11 doesn't result in a response, one way that you
12 could -- another way you could have of enumerating
13 that household is through a proxy response, which
14 means trying to obtain a response from someone who
15 is not a member of that household about that
16 household, correct?

17 A Yes.

18 Q And the Census Bureau agrees that proxy
19 enumeration generally results in lower quality
20 enumeration data than self-responses, correct?

21 A Yes.

22 Q And the Census Bureau agrees that a proxy

1 response is more likely to result in the omission
2 of a household member than a self-response,
3 correct?

4 A I haven't looked at the table recently,
5 but I believe that's correct, yes.

6 Q Let's go to the white paper again. And I
7 want to look at page 12, Bates number
8 COM_DIS09844, figure 3.

9 A Figure 3, did you say?

10 Q I believe so. On page 12?

11 A Okay. I thought I heard 4.

12 Q Okay. Figure 3 depicts unit non-response
13 to the ACS from 2010 through 2016 comparing census
14 tracts with the lowest decile of housing units
15 containing a non-citizen to the census tracts in
16 the highest decile of housing units containing a
17 non-citizen, correct?

18 A Correct.

19 Q And for each year of ACS depicted here,
20 census tracts in the highest decile of housing
21 units containing a non-citizen have a lower
22 response rate to the ACS than do census tracts in

1 Q You mentioned differences between NRFU
2 efforts in 2020 versus NRFU efforts in 2010.
3 Could you elaborate on what those differences are
4 anticipated to be?

5 A The major differences in the NRFU from
6 2020 as compared to 2010 are the extensive use of
7 administrative records at both the determination
8 of occupied, vacant, delete, and potentially for
9 enumeration after the first non-response
10 follow-up.

11 Q Any other differences in the NRFU efforts
12 planned for 2020 versus 2010 other than the use of
13 administrative records for enumeration purposes?

14 A The field operations are controlled by a
15 field operational control system that contains a
16 very extensive route optimizer that we tested all
17 decade.

18 (Discussion held off the record.)

19 BY MR. HO:

20 Q Backing up for a moment, Dr. Abowd, does
21 the Census Bureau believe that it is reasonable to
22 be spending the increased amounts of money that it

1 will be forced to spend, and staff time, due to
2 the citizenship question being included on the
3 decennial questionnaire given the utility of the
4 data that will be on it?

5 A The Census Bureau has been instructed to
6 include a citizenship question on the 2020 census
7 and has attempted to quantify the consequences of
8 that for the operations of the 2020 census. That
9 quantification suggests increases in the
10 non-response follow-up costs and a deterioration
11 in the quality of the response data. And we are
12 prepared to conduct the census with those extra
13 resources in NRFU and taking account of the change
14 in the quality of the data.

15 Q Dr. Abowd, you testified that one of the
16 reasons why the Census Bureau rejected the RCT
17 proposal is that it didn't make sense from a
18 cost-benefit perspective, correct, in the view of
19 the Census Bureau?

20 A Correct.

21 Q In the view of the Census Bureau, does it
22 make sense from a cost-benefit perspective to add

Exhibit 6

Page 1

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- - - - -x
NEW YORK IMMIGRATION :
COALITION, et al., :
:
Plaintiffs, :
:
v. : Case No.
:
1:18-CF-05025-JMF
UNITED STATES DEPARTMENT :
OF COMMERCE, et al., :
:
Defendants. :

- - - - -x
Friday, October 12, 2018
Washington, D.C.

Videotaped Deposition of:

JOHN M. ABOWD, Ph.D.,
called for oral examination by counsel for the
Plaintiffs, pursuant to notice, at the law offices of
Arnold & Porter Kaye Scholer, LLP, 601 Massachusetts
Avenue, Northwest, Washington, D.C. 20001-3743,
before Christina S. Hotsko, RPR, CRR, of Veritext
Legal Solutions, a Notary Public in and for the
District of Columbia, beginning at 9:06 a.m., when
were present on behalf of the respective parties:

1 enter into the computation of net undercount in a
2 very complicated way, and as a consequence, I have
3 not been able to make a reasonable, credible,
4 quantitative evidence of the effect on undercount.

5 I accept that it's possible that the
6 undercount will go up. I accept that it's
7 possible that the undercount will go down. I
8 provided evidence that components of the
9 undercount will change, but those components don't
10 enter into the calculation of the undercount with
11 the same sign. So when one of them changes, you
12 have to also compensate by calculating the changes
13 in the others. And if you don't have magnitude
14 estimates, you can't get an estimate for the net
15 undercount effect.

16 So --

17 Q. Thank you. We'll --

18 A. So you can't say it's likely without that
19 qualitative evidence. It's certainly possible.

20 And the quality degradation associated with the
21 components is documented and was sufficient for
22 us, as a bureau, to recommend that the question

1 not be asked. But we don't have quantitative
2 evidence that the undercount will likely increase.

3 Q. Thank you. We'll be spending some time
4 most likely this afternoon going through some of
5 that in more detail.

6 Why don't you continue with
7 Dr. Thompson's report.

8 A. In the following paragraph, I don't
9 take -- I don't take issue with his summary of the
10 facts or the evidence that's put forward. He
11 concludes, "These facts all strongly suggest that
12 NRFU efforts may be unsuccessful with respect to
13 households that decline to answer the decennial
14 census questionnaire because of the citizenship
15 question, particularly non-citizen households."

16 I've hash-tagged that number 4.

17 I'm going to have to presume that
18 Mr. Thompson means by "unsuccessful" that the same
19 measures that we would use inside the Census
20 Bureau as unsuccessful, which means that the
21 address in the NAF file passes all the way to
22 count imputation.

1 If he means by that conclusion that the
2 quality of the data produced in NRFU is not
3 comparable to the quality of the data produced in
4 self-response, I completely agree. If he means
5 that more cases will pass to count imputation, I
6 accept that that's a possibility. But at the
7 moment, the fraction of cases passing to count
8 imputation is expected to be very small, and I'm
9 prepared to discuss why we think it will be very
10 small with or without the citizenship question on
11 the 2020 census.

12 Q. Okay. Thank you. Why don't you proceed.

13 A. That's all.

14 Q. So beyond the four points you identified,
15 you're not planning to express any opinions
16 critical of Dr. Thompson's report at trial,
17 correct?

18 A. That's correct.

19 Q. Okay. Have you reviewed the -- you can
20 set 3 aside.

21 Have you reviewed the September 7th
22 report of Dr. Hermann Habermann?

1 and identify any points of disagreement.

2 A. Okay. In his rebuttal report,
3 paragraph 3 -- do you want me to use a separate
4 numbering set now? Start with 1 again?

5 Q. Why don't we start with 1 again. And
6 just so the record is clear -- this was clear
7 before the break, but you're marking Exhibit 6.

8 A. I am marking Exhibit 6, the expert
9 rebuttal report of Matthew A. Barreto, Ph.D. And
10 I have just marked paragraph 3 with my number 1.

11 I disagree with the entire paragraph. I
12 offered specific quantitative evidence. I
13 demonstrated the adequacy of the testing of the
14 citizenship question."

15 Q. Okay. If you could continue.

16 A. I disagree with paragraph number 4. I'm
17 marking it number 2. It says that I haven't said
18 why I reject his arguments, but I have now.

19 Do you want me to repeat those?

20 Q. No. I think the question is -- the
21 observation is whether you've critiqued them in
22 your report.

1 A. Oh, I can -- I acknowledge that I did not
2 critique them in my report.

3 Q. Okay.

4 A. Do you want me to cross that out?

5 Q. It's fine. The record is clear this way.

6 A. I didn't realize that the paragraph
7 continued on the next page, so I may want to make
8 specific comments about it.

9 Yes, I'm going to make the specific
10 comment that my expert report, and many of the
11 other expert reports in this case, acknowledge the
12 data quality issues associated with lower
13 self-response. And I believe that my expert
14 report provides credible quantitative evidence
15 that lower self-response is something that we
16 should expect.

17 There are specific consequences of lower
18 self-response that can be quantified, and I
19 believe that I've quantified them. The net
20 undercount -- I know we're going to get to this,
21 but the net undercount has not been quantified,
22 either by Dr. Barreto or me. And when I say no

1 credible evidence that the citizenship question
2 will have a bearing on the net undercount has been
3 entered, that's what I mean.

4 I object to paragraph 5. I'm marking it
5 with number 3. I have acknowledged that missing
6 data imputation with respect to characteristics is
7 less accurate in non-response follow-up. I have
8 not produced, and Dr. Barreto has not produced,
9 any quantitative evidence to show that that
10 applies -- credible quantitative evidence to show
11 that that applies to count imputation, nor to show
12 that more cases will get to count imputation.

13 I disagree with paragraph 7. I'm
14 labeling it number 4 with my initials.

15 What my expert report asserts is that the
16 design of the NRFU operation and the budgetary
17 envelope that it's going to be conducted under are
18 sufficient to deliver data of the accuracy that
19 that non-response follow-up operation was designed
20 to produce. That's not the same thing as saying
21 that they will produce data of accuracy that the
22 parameters that were in place before the insertion

1 Why don't we continue with Dr. Barreto.

2 A. Okay. I disagree with paragraph 12. I'm
3 labeling it --

4 Q. You're up to number 8.

5 A. -- 8.

6 As far as I'm aware, these studies do not
7 show a systematic bias in net undercount
8 identified from their study of particular family
9 situations.

10 I accept the conclusion that these
11 neighborhoods are difficult -- more difficult to
12 get characteristic data in.

13 I disagree with paragraph 13. I'm
14 labeling it number 9. It's a repeat of his
15 disagreement with my claim that there's no
16 credible evidence that the net undercount will go
17 up. And I've already defended that. So I
18 disagree with this paragraph for the same reason
19 that I've already stated.

20 I disagree with paragraph 14. I'm
21 labeling it number 10. I don't believe that the
22 RCT that was embedded in the survey that

1 Dr. Barreto ran is strong enough to meet the
2 randomized control trial criterion that we would
3 normally impose. However, I accept the evidence
4 that self-response rates in that survey were lower
5 for the group that got the treatment. Professed
6 self-response rates were lower.

7 So I don't think we have an argument over
8 whether that could be used to get some evidence
9 about self-response rates. We have an argument
10 over the subsequent conclusions.

11 I disagree with paragraph 15. I'm
12 labeling it number 11. The reasons are now
13 getting repetitive, but basically I don't think he
14 properly analyzed the relationship of his survey
15 to the non-response follow-up operation on the
16 2020 census. And the experts in the case,
17 including Dr. Barreto, are in agreement about the
18 degradation in the quality of the characteristics.
19 We appear to be primarily in disagreement about
20 whether you can make a quantitative inference
21 about the net undercount. And I continue to
22 disagree with his inferences about the net

1 undercount.

2 I feel like I need to disagree with
3 paragraph 16, so I'm labeling it number 12. The
4 research cited in paragraph 16 stems from the
5 extensive debate in the '90s and early 2000s about
6 whether to use dual system estimation to actually
7 adjust the population counts following a census.
8 The Census Bureau designed the 2010 non-response
9 follow -- sorry, the 2010 coverage measurement
10 system only to learn about the quality of the
11 census and not to learn with sufficient precision
12 things that could be adjusted.

13 So I believe it's fair to say that the
14 census -- well, so I -- as an expert, I accept
15 that dual system estimation would be problematic
16 for adjusting population counts. And at the
17 Census Bureau, we do not adjust the population
18 estimates from one census to another census even
19 though we have the dual system estimator that
20 would allow us to do that for a variety of
21 reasons.

22 But we do use dual system estimation as

1 one tool, one very important tool, to try to
2 assess the quality of the census count. We don't
3 got -- draw large enough samples any longer to go
4 into the kind of detail that the research in the
5 '90s and the early 2000s did in the ACE program --
6 I'm sorry, I can't expand the acronym anymore.
7 The coverage survey that accompanied the 2000
8 census was 750,000 households, not 170,000
9 households.

10 Q. Okay. Thank you.

11 A. So I disagree with paragraph 17. I'm
12 marking it number 13. The official net undercount
13 for 2010 was a minuscule overcount that was
14 swamped by its standard error. And so it was not
15 an undercount. So that's just factually wrong.

16 As regards differential undercounts, we
17 did have a differential undercount for some of the
18 populations noted in this paragraph, but it was
19 smaller in 2010 than it was in 2000.

20 Q. I'm sorry, it was smaller in 2010 than in
21 2000?

22 A. Yes.

1 I disagree with paragraph 14 -- sorry,
2 paragraph 18. I'm labeling it number 14.

3 I did present quantitative evidence. I
4 distinguished carefully between net undercount and
5 other measures of census quality. And my report
6 documents those quantitative effects that I think
7 can be documented.

8 I disagree with paragraph 26.

9 Q. Number 15.

10 A. Number 15.

11 Q. If you could mark that number 15.

12 A. I acknowledge that the report does
13 indicate how the operation of NRFU would work, and
14 that does involve lots of moving of enumerators
15 around in response to actual as opposed to
16 predicted self-response. But I also said that the
17 integrated partnership and communication program
18 would work with the partners and is already hiring
19 partners to work with in order to establish with
20 the trusted voices how to message that
21 participation in the census is still very
22 important and the community itself will be harmed

1 say, this is the paragraph I'm relying on when I
2 criticize Dr. Barreto. Is that what you want me
3 to do?

4 Q. I'm not asking for you to say -- I mean,
5 obviously, on the testing point, we understand
6 your position on testing, and we'll spend some
7 time talking about that as well.

8 I'm trying to understand from your report
9 what one could glean your criticisms of
10 Dr. Barreto are. If it's in the report. If it's
11 not in your report, then, you know, we can discuss
12 that.

13 A. So my report deals with the specific ways
14 in which we intend to mitigate the consequences of
15 placing the citizenship question on the
16 2020 census. My principal criticism of
17 Dr. Barreto's report was that he misinterpreted
18 many of the things that I said. And when they
19 were interpreted properly and in the context of
20 what I wrote, they support many of the points that
21 he was trying to make, but they don't support a
22 conclusion about net undercount.

1 I feel that the failure to distinguish
2 between the components of the quality of the
3 census and a quantitative estimate of the effect
4 on net undercount is an important expert point.

5 And I defend in the report the position that we
6 did document that the question itself was going to
7 cause difficulties in conducting the census.

8 We weren't -- we weren't asked to design
9 a 2020 census that could produce a CVAP table and
10 make the decision ourself about whether the
11 question would be on the census.

12 From an expert point of view, the
13 quantitative question of where do the effects show
14 up are addressed in my report.

15 The conclusion that that means
16 necessarily that we expect a larger net undercount
17 is unsupported by the data. It does mean that we
18 are going to have more difficulty estimating the
19 count. There's no question about that. And that
20 we're going to have much less reliable data to the
21 extent that we don't get self-responses on some
22 portions of the population that don't cooperate.

1 These are distinct quality measures that
2 we have -- I have consistently, both in fact and
3 in expert testimony, identified and quantified.

4 The fact that they can't be used directly to
5 produce a net undercount estimate hasn't affected
6 my opinion about whether the question should be on
7 the census. It hasn't affected the Census
8 Bureau's recommendation about the question.

9 It seems to me to be something that is
10 undocumented by the plaintiffs' experts and that I
11 specifically call out as undocumented in my expert
12 report.

13 Q. So I -- I understand that. And we'll
14 spend some time going through that language and --
15 just to make sure we understand exactly what your
16 view is.

17 You had a range, though, of criticisms of
18 Dr. Barreto, for example, in his main report about
19 his survey methodology and --

20 A. Right.

21 Q. -- survey design. Is any of that in your
22 report?

1 A. Oh, I see, okay.

2 Q. I am cheating.

3 What -- can you just explain that? What
4 is the difference and why is it an important
5 difference?

6 A. So my expert report attempts to document
7 why we believe that it's possible -- likely that
8 we can conduct a non-response follow-up operation
9 as designed and get responses for the vast
10 majority of the addresses.

11 We consider that operation to be
12 successful for the purposes of the actual
13 enumeration account if we have a small
14 percentage -- very small percentage -- that go to
15 count imputation. And we use count imputation to
16 do the rest. Count imputation is the best
17 available method for correcting what should be a
18 very small percentage of the addresses that we
19 can't resolve.

20 Q. For example, what was --

21 A. The rest --

22 Q. Sorry.

1 A. The rest of that nuanced answer was
2 basically saying, if you go into non-response
3 follow-up with less self-response, you get lower
4 quality data. And I don't think anyone is arguing
5 about that.

6 But we've had declining self-response for
7 decades, and we've had the opportunity to refine
8 the non-response follow-up system so that it could
9 ultimately get to the constitutional objective of
10 the census, which is to get an actual enumeration
11 within the resources that we are given to do that.

12 And so the question of mitigating the
13 data quality consequences of a citizenship
14 question has two parts. It's a mitigation if you
15 can use the operation of the NRFU as you designed
16 it and still accomplish its purpose. And that's
17 what my expert report is designed to inform.
18 That's -- its ultimate purpose is to get that
19 constitutional enumeration as accurate as we can
20 get it.

21 There are many, many other uses for the
22 census. They depend much more critically on the

1 quality of the characteristic data, and they will
2 be affected. And I've testified to that as an
3 expert and as a fact witness. And I don't believe
4 my expert report or the other expert reports
5 challenges that.

6 Q. That's fair. So just in terms of helping
7 us understand, so before the citizenship question
8 was adopted, was there a target or a parameter for
9 the percentage of NRFU that would ultimately go to
10 enumeration that would constitute a successful
11 NRFU operation? I'm sorry, I said enumeration,
12 but I meant imputation. Was there a set
13 percentage or a goal or a target for imputation
14 that would define a successful NRFU operation?

15 A. So -- I'm pausing because I don't think
16 anything in the operational plan or the life cycle
17 cost estimate depends upon the number of
18 households that get to count imputation. The
19 closest is the estimated workload that goes to 6.
20 And I do -- in my report -- if you'll just give me
21 a second -- I think I -- I think I have that in
22 here.

1 increases the self -- that lowers the
2 self-response rate and then increases the
3 non-response follow-up identifies the operations
4 required in order to increase the -- in order to
5 get responses from the increased workload that
6 that will involve.

7 So that is not a pious hope. That is
8 saying if the objective is to get through the
9 entire master address file and resolve the
10 occupancy status for each of those addresses and
11 then get a questionnaire for occupied households,
12 then we have demonstrated why we -- I'm sorry.

13 I believe that the NRFU process in place
14 for the Census Bureau is designed to do that and
15 can be operated effectively to do that. That is
16 evidence, because the goal of that process is to
17 resolve the occupancy status -- the first goal in
18 that process is to resolve the occupancy status of
19 each of the addresses. The second goal is to get
20 a questionnaire.

21 The overall census goal, count every
22 person once, only once, and in the right place,

1 depends critically on the first goal of resolving
2 the occupancy status and getting a count inside
3 the occupied households.

4 The remaining statutory and social uses
5 of the data depend critically on the quality of
6 the responses that we get. And our ability to
7 evaluate the quality of those responses also
8 depends on getting data on those households.

9 There's no disagreement that those data
10 are not going to be as good. But all the way to
11 the count, if you can establish that the design of
12 the NRFU should be successful in resolving the
13 count status of every address, then to the
14 enumeration question, the net undercount, there is
15 evidence. It's -- there's no evidence -- let me
16 put this differently.

17 The effects that are documented in my
18 expert report are intended to show that it's going
19 to be more expensive and produce lower quality
20 data. But we couldn't find a quantitative effect
21 from that process on the net undercount. That's
22 not a pious hope. That is scientific evidence

1 from the design of the NRFU.

2 Q. Okay. Thank you.

3 A. Page 16. The single-sentence paragraph
4 that begins, "Whatever method used, imputation
5 further systematically disadvantages hard-to-count
6 subpopulations, in particular, non-citizens and
7 households containing non-citizens."

8 Q. You're up to number 5.

9 A. Number 5, yeah. I don't accept that
10 there's been any quantitative evidence presented
11 that that conclusion applies to count imputation.

12 Q. Is there any evidence, period? You said
13 quantitative --

14 A. Well, I'll acknowledge that
15 characteristic imputation has those problems.

16 Q. With regard to count imputation, is there
17 any evidence, even qualitative evidence, that
18 there's a difference?

19 A. Well -- yes, there's qualitative
20 evidence, ethnographic case studies and other
21 follow-ups that the Census Bureau and other
22 demographers have conducted. I acknowledge that.

1 THE WITNESS: -- was not significantly
2 different -- I'm just reading, I'm sorry. "The
3 Census Bureau's coverage evaluation from the 19 --
4 from the 2010 census showed that net undercount
5 for New York City overall, and for each of the
6 five boroughs, was not significantly different
7 from zero -- no undercount, in other words (the
8 same was true for 2000). However, when we look at
9 the components of net undercount, we see a
10 different perspective on the census error."

11 I agree with that conclusion. We use
12 slightly different implementations of the dual
13 system estimator. He has already subtracted off
14 whole-person census imputations, and the Census
15 Bureau leaves them as a separate component, but
16 they're not measured with error because they're
17 identified on each census record, so there's no
18 sampling error associated with them.

19 So -- so in his world, omissions -- or
20 net undercount is omissions minus erroneous
21 enumerations. And in my world, net undercount is
22 omissions minus erroneous enumerations minus

1 whole-person census imputations. And in his
2 world, the target is the data-defined census
3 count. And in my world, the target is the actual
4 census count.

5 Those are very subtle differences in the
6 way you use net undercount statistics. But
7 there's no disagreement among the experts in this
8 case that the components are all -- are going to
9 move around. And that is what I meant when I
10 wrote, in my official capacity, degradation of the
11 quality of the census data. But he's also quite
12 aware that they can cancel out. And the point
13 he's made about New York City here shows that they
14 do cancel out in some cases. They don't always
15 cancel out. I'm not saying they always cancel
16 out. I am saying that you really have to do the
17 whole analysis with the quantifiers in order to
18 say what the effect of the net undercount is.

19 As to the components, I accept that.

20 Q. Thank you. If you could continue.

21 A. Okay. I think the right place to mark it
22 is on page 15, the last partial paragraph and as

1 Q. Thank you. Please continue.

2 A. On page 20, the conclusion -- I think
3 this is just a restating of the conclusion that I
4 called out on -- in the initial bullets. But the
5 paragraph that begins, "The Abowd report."

6 And am I at 5 or 6?

7 Q. You're at, I think, actually, 4.

8 A. All right. I'll number it 4.

9 I believe that my report and my other
10 testimony fully acknowledge the data quality
11 consequences of having to use more NRFU.

12 Q. Okay. Any -- do you have any other
13 criticisms of --

14 A. No.

15 Q. -- Mr. Salvo's report?

16 A. No.

17 MR. FREEDMAN: We will break for lunch.

18 BY MR. FREEDMAN:

19 Q. Before we do, just for estimating
20 purposes, have you reviewed the reports of Bernard
21 Fraga?

22 A. No.